## Calculation of N, P, and SS load factors by a simple basin land-use model –Analysis of Hokkaido and Tohoku regions–

\*Seiko Yoshikawa<sup>1</sup>, Yuta Shimizu<sup>2</sup>, Kenji Matsumori<sup>2</sup>

1. Inst. Agro-environ. Sci., NARO, 2. West. Reg. Agric. Res. Cent., NARO

The factors showing the largeness of N, PP, and SS loads from agricultural lands to river water were calculated by a simple basin model. The paddy, upland, forest, building site ratios of river basins were determined for Hokkaido and Tohoku regions by GIS technique using DEM and LULC data. The 10-years-average N, P, and SS concentrations for each river water were calculated by published data. The respective coefficients (N, P, and SS load factors) were obtained from the paddy, upland, forest, building site ratios and the objective variable (N, P, and SS concentrations) by applying a multiple regression analysis. The N load factor was -2.4,2.4,0.1, and 39.8 for the basins in Hokkaido (n=13), 2.9, 9.8\*\*, 0.49, and -6.8 for the basins in Tohoku (n=12), and 1.2,6.7,0.4,4.3 for the sub basins in Tohoku (n=12) for paddy, upland, forest, building site, respectively. The P load factors were 0.08,0.07,0.02, and 1.4 for the Hokkaido basins, 0.20\*\*, 0.23\*\*, 0.00, and 0.01 for the Tohoku basins, and 0.15, 0.10, 0.00, and 0.80\* for the Tohoku sub basins for paddy, upland, forest, building site, respectively (\* 5% \*\* 1% significance). The N and P load factors were highest for building site in Hokkaido. They were highest for upland in Tohoku. The dependencies of the N and P load factors to the basin size were not found. The surplus applied N for each Province in Tohoku was gently correlated to the N concentration of the corresponding river water, but not for P. The SS load factors obtained for Hokkaido were especially low reliability. The SS load factors were calculated provisionally 21.7,47.9,4.3, and -0.94 for the Tohoku basins, and 25.4.-17.3,2.6, and 122.0 for the Tohoku sub basins for paddy, upland, forest, building site, respectively. The lower reliability of the SS load factors might be caused by the SS high sensitivity to the individual rainfall event.

Keywords: basin model, land use, non-point source load factor, nutrients